WRAPAROUND CARTON WITH INCLINED BEAM STRUCTURE AND BLANK THEREFOR

This is a continuation of international application No. PCT/US02/08007, filed March 4, 2002, which is hereby incorporated by reference.

Background of the Invention

The present invention relates to a carton and a blank for forming the same. More particularly, the present invention relates to a carton incorporating a beam structure adapted to fit in the recess between interconnected cups or pots of so-called brick packages, for example.

Such groupings may constitute a single pair or any other desired arrangement such as two rows of two packages each, two rows of three, four or five packages each or greater number of rows desired number of containers. Ordinarily, such containers are relatively small and in order to provide for efficient handling during shipment and displays in retail outlets, it is desirable to stack the articles in tiers one above the other.

For the purposes of this application, each cup or pot is considered to represent a separate article. Some cups or pots are subdivided into separate sections (e.g. yoghurt pots in which the flavouring is in a separate section from the yoghurt).

This invention relates particularly to a beam structure which interconnects a carton side or top wall with its base wall such that the longitudinal axis of the beam is inclined relative to the plane of the carton's top wall and engages with a recess between adjacent pots. Previous beams have required the carton to be applied to an upright article grouping from below. Examples of such cartons are disclosed in EP 0 972 718 A1 to Goossens Beauvais and FR 2 423 399 to Calvert.

One problem of such cartons is that they are incompatible with conventional wraparound packaging machinery in which the carton is applied to the article grouping from above or below and is wrapped around the article grouping.

Summary of the Invention

The present invention seeks to overcome or at least mitigate the problems of the prior art.

According to a first aspect of the invention there is provided a wraparound carton for packaging two or more articles with a recess defined between adjacent articles, the carton comprising a top wall, a side wall, a base wall and a beam structure arranged to form a tubular structure so as to encircle the article wherein the beam structure is arranged to be placed in the recess and is hingedly interconnected at one end thereof to the base wall.

Preferably the carton is provided with a second side wall and wherein the second end of the beam structure is hingedly connected to the second side wall. More preferably the second end is hingedly connected to the second side wall intermediate the upper edge and the base of the article.

Alternatively, the second end of the beam structure is hingedly connected to the top wall of the carton.

According to an optional feature of this aspect of the invention, the beam structure comprises a pair of support panels hingedly connected along a common longitudinal edge.

The support panels may define therebetween an acute angle to facilitate formation of the beam.

According to another optional feature of this aspect of the present invention, there further comprises a medial panel intermediate and hingedly interconnecting the support panels along their common longitudinal edge.

According to yet another optional feature of this aspect of the present invention, the support panels are hingedly connected to the adjacent wall panel by one or more bracket panels. The bracket panels may be trapezoidal in shape.

In some embodiments, there may further comprise a pair of gusset panels hingedly connected to said bracket panel and folded out of alignment therewith, wherein said pair of gusset panels hingedly connect said support panels to said bracket panel. The gusset panels are preferably, folded out of alignment with respect to each said support panel so as to abut a wall of the adjacent articles.

According to an optional feature of this aspect of the present invention part of said support panels may each abut a wall of adjacent articles.

According to a second aspect of the invention there is provided blank for wraparound carton comprising a plurality of wall panels hingedly interconnected in series, wherein the wall panels include a pair of base panels at the opposite end to the blank, and wherein one of the base panels is connected to an adjacent wall panel through a beam forming portion that includes a bracket panel hingedly connected to the base panel and a pair of support panels both connected to the bracket panel and extending to said adjacent wall panel.

Preferably an opposing end of the beam forming structure is hingedly connected to a side wall panel. More preferably, the distance between the fold lines hingedly interconnecting the side wall panel and the beam forming structure and top wall respectively in less than the distance between the top and base of the article to be packaged.

Alternatively, the first end of the beam structure is hingedly interconnected to the top wall panel of the carton.

According to an optional feature of this aspect of the invention, the pair of support panels may be separated by a medial panel.

According to another optional feature of this aspect of the present invention, the bracket panels are trapezoidal in shape. Alternatively, the bracket panels are triangular in shape.

According to another optional feature of this aspect of the present invention there further comprises a pair of gusset panels hingedly connected to said bracket panel wherein said pairs of gusset panels hingedly connect said support panels to said bracket panel.

A third aspect of the invention provides a method of forming a carton from the blank comprising the steps of :-
(i) introducing an array of articles having a recess defined between adjacent articles, to the blank; (ii) inserting the beam forming portion into the recess to cause the support panels to be folded out of alignment and to engage the walls of the adjacent articles; and (iii) fold the top base panels into overlapping arrangement to be secured together.

Brief Description of the Drawings

Exemplary embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

FIGURE 1 shows a blank for forming a wraparound carton incorporating a beam structure according to one embodiment of the invention;

FIGURE 2 shows an inverted perspective view of the blank of Figure 1 shown having an article introduced thereto;

FIGURES 3 and 4 show inverted perspective views of successive stages of the carton erection process;

FIGURES 5 and 6 show perspective views a fully erected and loaded carton formed from the blank shown in Figure 1;

FIGURE 7 shows a blank for forming a wraparound carton incorporating a beam structure according to a second embodiment of the invention; and

FIGURES 8 and 9 show perspective views a fully erected and loaded carton formed from the blank shown in Figure 1.

Detailed Description of the Preferred Embodiments

Referring to the drawings, and in particular Figure 1, there is shown one example of a blank 10 made from paperboard or similar foldable sheet material for forming a wraparound carton according to the invention having a plurality of panels for forming a beam structure 14 provided therewith, for packaging one or more articles. The blank comprises in series a plurality of panels for forming a carton having a top, a base and opposed side walls. In this embodiment, there comprises a first base wall panel 12, the beam structure 14, a first side wall panel 16, a top wall panel 18, a second side wall panel 20 and a second base wall panel 12 hingedly interconnected in series along fold lines 30, 32, 24, 26, 28 respectively.

The beam structure 14 extends between, and is hingedly connected to the first base wall panel 12 and first side wall panel 16 via a pair of bracket arrangements. Thus, the beam

structure 14 can be interposed between portions of the article(s) to support it. Preferably the beam structure 14 is struck from at least in part the first base panel 12 and first side wall panel 16, so that those parts of the aforesaid panels not forming the beam structure, form part of the external walls.

In this embodiment, each bracket arrangement comprises a bracket panel 34, 36 hingedly connected along one edge to the first base wall panel 12 along fold line 30 and first side wall panel along fold line 32 respectively. Preferably, the bracket panels 34, 36 are substantially trapezoidal in shape and fold lines 30, 32 are provided along their longest edges. Each bracket panel 34, 36 is hinged along each of its opposing oblique side edges to a pair of gusset panels 42a, 42b and 42c, 42d along fold lines 44a, 44b, 44c, 44d respectively. The gusset panels 42a, 42b, 42c, 42d are substantially triangular in shape, in the preferred embodiment of Figure 1. Of course the shape of the bracket panel and/or gusset panels are not limited to the shapes described above and it is envisaged that other shapes could be used to provide a beam of a substantially inverted "V" shaped cross-section, for example.

Gusset panels 42a and 42b are hingedly connected along fold line 46a to first and second end article support panels 38 and 40 respectively. Likewise, gusset panels 42c and 42d are hingedly connected along fold line 46b to opposite ends of the first and second article support panels 38 and 40 respectively.

In this embodiment, a medial panel 48 separates the article support panels 38, 40 and is hingedly connected thereto along its side edges by fold lines 50, 52. The medial panel 48 is, in the preferred embodiment, hingedly connected to the shortest edge of bracket panels 34 and 36 by fold lines 46a and 46b.

Turning to the construction of the carton illustrated in Figures 2, 3 and 4, it is envisaged that the carton of the present invention can be formed by a series of sequential folding

and, optionally, gluing operations which can be performed in a known straight line machine so that the carton is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and can be altered according to particular manufacturing requirements. The articles are shown inverted for clarity only.

Referring first to Figure 2, the top wall panel 18 of carton blank 10 is brought into contact with the upper planar face of the articles A by relative vertical motion therebetween. Turning to Figure 3, the blank 10 is then part erected to provide a pair of oppositely disposed side walls by folding side wall panels 16, 20 inwardly about fold lines 24 and 26. The bracket panels 34, 36 are folded out of alignment with first base wall panel 12 and first side wall panel 16, such that first base wall panel 12 overlies the base of the articles A.

Meanwhile, or contemporaneously, the beam structure 14 is constructed by folding first and second support panels 38, 40 along common fold lines 50, 52 into an angular relationship with each other and with medial panel 48 (Figure 4), such that medial panel 48 is uppermost. The folding of the first and second support panels 38, 40 simultaneously causes gusset panels 42a, 42b and 42c, 42d to be folded out of alignment with bracket panels 34, 36.

Beneficially, the first and second support panels are automatically folded by virtue of the introduction of the beam structure into the gap between adjacent articles A. For this to be achieved, the width of the medial panel 48 is equal to or less than the spacing between adjacent pots but the overall unfolded width of the beam structure 14 is wider than the spacing between pots. The intrinsic resilience of the folded paperboard ensures that a snug fit is maintained between the support panels 38, 40 and the articles.

Second base wall panel 22 is then folded over the base of articles A and is secured to first

base wall panel 13 using glue, or other suitable means known in the art, such as mechanical interlocking means, for example thereby, forming a composite base wall. The carton is now fully erected, as shown in Figures 4, 5 and 6 with a beam of a substantially inverted "U" shaped cross section.

It is envisaged that the angular relationship between support panels 38 and 40 can be altered by moving fold lines 44a, 44b, 44c, 44d and/or fold lines 46a, 46b according to particular requirements of the beam structure 14. The bracket panels 34, 36 are not limited to being of trapezoidal shape. In other classes of embodiment, it is envisaged that the support panels may be folded upwardly to form a beam of inverted structure. In some embodiments, second base wall panel may be extended to cover the entire base, and may potentially be provided with a flap to be secured to first side wall panel 16.

In some embodiments, the beam support panels may flex, shown in Figure 5, so as to engage the articles to improve rigidity of the carton. In these embodiments the support panels function as engaging strips. Preferably the panels 38, 40 flex along the fold lines 44a, 50, 44d; and 44b, 52, 44c and these fold lines may be oriented so as to better confirm to the shape of the adjacent article.

Turning to a second embodiment of the invention as illustrated in Figures 7, 8 and 9, like parts have, where possible, been represented by like numerals with the addition of the pre-fix "1". The second embodiment is similar to the first embodiment, so only the differences are described in any greater detail.

Referring in particular to the blank 110 as illustrated in Figure 7, this embodiment differs from the first embodiment in that the first side wall panel has been omitted and the beam structure 114 is thus hingedly interconnected directly to top wall panel 118 along fold line 132. Additionally, the beam structure has been extended in length to compensate for the omission of the first side wall panel.

Turning to the beam structure 114 in more detail, it can be seen that in this embodiment support panels 138 and 140 are mutually hingedly connected along a common fold line 143 and further, that the gusset panels have been omitted such that support panels 138 and 140 are trapezoidal in shape and are directly hingedly interconnected to bracket panels 134 and 136 along fold lines 135, 139 and 137, 141 respectively.

Turning to the construction of the carton to form a fully set up carton as illustrated in Figures 8 and 9, it is again envisaged that the carton of the second embodiment can be formed by a series of sequential folding and gluing operations which can be performed in a straight line machine so that the carton is not required to be rotated or inverted to complete its construction.

The folding operation is substantially as described in the first embodiment and results in the blank forming a tubular carton encircling the articles A. Thereafter, first and second base wall panels 112 and 122 being secured together using glue or other suitable means known in the art to form a composite base wall as shown in Figure 8.

The beam structure 114 is constructed by folding first and second support panels 138 and 140 along their common fold line 143 into an angular relationship with each other such that the fold line 143 is uppermost, in this embodiment.

Beneficially, the first and second support panels are automatically folded by virtue of the introduction of the beam structure 114 into the gap between adjacent articles A. For this to be achieved, the width of the support panels 138, 140 when in a co-planar state are wider than the space inbetween pots. Again, the intrinsic resilience of the folded paperboard ensures that a snug fit is maintained between the support panels 138, 140 and the articles.

It will be appreciated by those skilled in the art that the combination of a wraparound arrangement with a inclined beam interposed between articles substantially prevents the relative movement of the articles A and carton which may otherwise compromise the automated handling of the cartons and the stacking thereof. Thus, the beam arrangement may be used to replace end retention means which have hitherto been used to prevent relative horizontal movement between articles and carton, but which generally require an additional folding step to be carried out as part of the erection process.

It will be recognized that as used herein, the terms "top", "base", "side", "upper" and "lower" with respect to the panels of the carton are relative terms, and that the carton may be re-oriented as necessary or as desired. Any reference to hinged connections should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that a hinged connection can be formed from a score line, a frangible line or one, two or more fold lines without departing from the scope of invention.

The present invention and its preferred embodiment relates to a beam structure in a wraparound carton which is shaped to provide satisfactory strength to hold at least one article securely but with a degree of flexibility so that the load transferred to the beam structure is absorbed by the carton. The shape of the blank minimizes the amount of paperboard required. The carton can be applied to an array of articles by hand or automatic machinery.

What is claimed is: